

REPORT

Municipality of Crowsnest Pass

Preliminary Phase II Environmental Site Assessment Old Sartoris Staging Area SE-35-007-04 W5M



NOVEMBER 2023

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EXECUTIVE SUMMARY

The Municipality of Crowsnest Pass (MCNP) retained Associated Environmental Consultants Inc. (Associated) to conduct a preliminary Phase II Environmental Site Assessment (ESA) at the Old Sartoris Staging Area nuisance ground (Site) within the MCNP. The Site is located near Blairmore, Alberta, at SE-35-007-04 W5M, south of 15 Avenue.

In 2022, Associated completed an Environmental Overview of nuisance grounds within the municipality to determine whether setback variances were needed for previous and future developments within 300 metres (m) of multiple landfill sites per the Guideline for Setback Reviews [Waste Facility] document. The Site was used for waste disposal prior to 1949 and stopped being used between 1978-1987. The Site is relatively flat and was reshaped, but the original ground surface slopes to the north. Buried waste consisted of metals, car parts, glass, wood, tires, cloth, crushed brick and layers of ash, which indicate evidence of burning. There are dozens of existing residences within 120-300 m of buried waste boundaries, which are estimated to be hydraulically downgradient from the Site. The Site does not currently impact potential future neighbourhood locations.

This Phase II ESA was initiated to confirm whether there are impacts to human and ecological health receptors. The objectives of the preliminary Phase II ESA at the Site were:

- Initial characterization of buried waste and soil quality;
- Installation of groundwater monitoring wells and assess groundwater quality; and
- Installation of soil vapour monitoring wells and assess for landfill gas (methane).

The Phase II ESA actions and conclusions are:

- On June 22, 2023, six (6) boreholes were advanced using solid-stem drilling methods by Core Drilling. Three (3) boreholes were completed as groundwater monitoring wells (23OSMW01 through 23OSMW03) to a maximum depth of 11.4 metres below ground surface (mbgs) around the outer perimeter the buried waste. Three (3) boreholes, completed as soil vapour monitoring wells (23OSSV01 through 23OSSV03), were advanced to a maximum depth of 2.44 mbgs, adjacent to the respective groundwater monitoring wells.
- On June 27, 2022, three (3) test pits (23OS07 through 23OS09) were advanced using a backhoe supplied by the MCNP in locations with the highest electromagnetic values and waste concentrations according to the geophysical surveys conducted in 2022. Two soil samples were collected from each test pit: one within the waste and one from beneath the waste. Waste extended to a maximum depth of 3.6 mbgs.
- Mixed waste primarily consisted of ash layers, metals (some melted), glass (some melted), crushed brick, cables, and tires, and extended to a maximum depth of 3.6 mbgs.
- Soil contaminants of concern were identified in all three test pits, including various metals (antimony, arsenic, barium, chromium, cobalt, copper, lead, molybdenum, nickel, tin, and/or zinc), benzene, toluene, tetrachloroethylene (PCE), polycyclic aromatic hydrocarbons (PAH) (anthracene, fluoranthene, naphthalene, and/or phenanthrene), perfluorooctanoic acid (PFOA) and/or perfluorooctanesulphonic acid (PFOS).
- Most soil metal impacts were within mixed buried waste, but molybdenum, nickel, and/or tin exceedances occurred in the samples collected beneath the waste. Benzene and toluene impacts were generally within the mixed buried waste and were below AT1 Guidelines in samples from beneath the waste. PCE, PAH, PFOS, and PFOA impacts have not been fully delineated in the soil. Contamination in soil is interpreted to be from buried waste and burning. Confirmation sampling and analysis of PFOS and PFOA is needed to confirm its presence and if it a concern.

- Shallow groundwater depths ranged between 5.12 mbgs (23OSMW03) and 9.18 mbgs (23OSMW02) on July 11, 2023. Inferred groundwater flow is to the north, with an estimated horizontal hydraulic gradient of 0.077, generally following the local topography.
- Groundwater parameters that exceeded applicable guidelines included TDS and nitrate (23OSMW02 only) and dissolved manganese in all three monitoring wells. TDS is not an environmental concern for the Site. The source of nitrate may be buried waste. Elevated dissolved manganese is currently not an environmental concern for the Site.
- The contaminants of concern that were identified in soil mixed with waste were not identified in groundwater. Therefore, it is likely that most soil contaminants are confined to areas with waste. However, further delineation is required.
- Methane concentrations were below detection limits in all monitoring wells. Although methane was not detected, volatile parameters were detected in the soil and soil vapour sampling for those parameters was not completed. Potential for soil vapour concerns remain; however, there is a lower potential for lateral migration of soil vapours to nearby structures because of the nature of the coarse-grained material which dominates the area
- There is currently insufficient information to eliminate exposure pathways to modify AT1 Guidelines.

Based on the limited results presented, there is low potential environmental concern for the existing properties within 300 m of the Site. It is the MCNP's discretion to permit renovations and infill housing, including houses with basements for existing properties and structures. The MCNP may want to consider the requirement of soil vapour barriers for new basements until further soil vapour assessment can be completed. For proposed new developments within 300 m of the Site, the MCNP should thoroughly review development applications and mandate that developers conduct an environmental assessment of the proposed development property to verify the absence of potential contamination and soil vapours.

Associated recommends the following:

- Notify Alberta Environment and Protected Areas of the Site and its reported impacts, as per requirements under Alberta's *Environmental Protection and Enhancement Act* and Alberta's Contaminated Sites Policy Framework.
- Limit public access to the Site and zone the area as commercial/industrial. This will protect direct human exposure and will assist in risk management of the Site.
- Conduct additional groundwater and soil vapour monitoring to confirm initial results. Alberta Environmental and Protected Areas typically prefers to see a minimum of four sampling events over different seasons to assess for seasonal variability and trends.
- Conduct additional test pits and collect soil samples to delineate nuisance ground impacts in soil, including background locations and beneath the waste.
- Install additional groundwater monitoring wells to determine vertical gradient and to delineate the extent of the nitrate exceedance once concentrations are confirmed by additional sampling.
- Conduct hydraulic conductivity tests to assess hydrogeologic conditions for site-specific modification of AT1 Guidelines.

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